bioEnergy! works

Another RBEP Success: 100% vegetable-based motor oil protects engines and reduces emissions

The Regional Biomass Energy Program (RBEP) promotes increased production and use of bioenergy resources, and helps advance the use of renewable biomass feedstocks and technologies. Historically, the RBEP leverages two nonfederal dollars for every federal dollar it administers.

Benefits of Bio-Oil

- *Reduces engine wear by more than 20% compared to conventional oils*
- *Provides 50% greater lubricity than conventional and synthetic oils*
- *Reduces oil consumption by more than 60%*
- *Reduces product weights that require less energy for shipping*
- *On average, improves gas mileage by more than 3%*
- *Is 230,000 times less toxic than used petroleum-based oils*

"This project will not only bring us a step closer to commercialization and use of an environmentally friendly, biodegradable motor oil, but will create an additional market for soybeans and canola."

Kathleen Wilber, Director
Michigan Department of
Consumer and Industry Services

Challenge

Experts have known for many years that bio-based lubricants, such as vegetable oil, can out-perform petroleum oils in many categories, including the ability to reduce friction, maintain a cleaner engine, and create fewer emissions. However, conventional vegetable oils are not practical for all-weather use as motor oils. They are not fluid below the freezing point and heat destroys these oils.

RBEP Solution

Great Lakes Oil, LLC, with initial funding and technical support from the U.S. Department of Energy's Regional Biomass Energy Program (RBEP), was formed to develop and market a wide range of lubricants derived from vegetables and oilseed crops.

The RBEP funding helped Great Lakes Oil develop its principal product, AMG2000, which features a special blend of vegetable oils with a molecular structure that sticks to metal surfaces, protects from corrosion, isolates water and dirt, doesn't boil off naturally, resists heat, and flows in the cold.

U.S. Department of Energy
Regional Biomass Energy Program
www.ott.doe.gov/rbep

Award

2000 Inherit the Earth (ITE) Silver Medal from Connecticut College for "Outstanding contribution to sustainable technology that benefits the environment" to the Agro Management Group, Inc., for AMG2000

Partners

U.S. Department of Energy Regional Biomass Energy Program

Michigan Department of Consumer & Industry Services (CIS), through the Michigan Innovative Farmers Association

Agro Management Group, Inc.

Thumb Oilseed Producers Cooperative (a group of 195 farmers throughout Huron, Sanilac, and Tuscola counties in Michigan)

Local Economic Development Corporations in a rural tri-county area in northern Michigan

Alternative Agricultural Research and Commercialization Corporation (AARCC)

United Soybean Board – New Uses Committee (USB - NUC)

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Results

Testing showed that, in many circumstances, AMG2000 proved more effective than traditional petroleum-based motor oils. In fact, during wear and lubricity testing against 15 conventional and synthetic motor oils, only some of the synthetic oils demonstrated better lubricity and none of the petroleum-based oils had a lower coefficient of friction than AMG2000.

During fleet tests, the U.S. Environmental Protection Agency monitored exhaust emissions from post office mail delivery vehicles through the U.S. Postal Service environmental group in Grand Rapids, Michigan. Measured exhaust emissions from the delivery vehicles using AMG2000 as their motor lubricant were significantly lower, compared to petroleum-based lubricants. The results showed that hydrocarbon emissions were reduced by 37% and carbon monoxide was reduced by more than 20%.

Benefits

Widespread use of AMG2000 could:

- Reduce U.S. dependency on petroleum-based oils by 1,840 drums of crude and 174 drums of finished crankcase oil for every 100 acres of canola raised
- Significantly reduce tailpipe emissions of carbon monoxide and hydrocarbons
- Provide materials that could be recycled into other products for industry